Feynman Computing Center Projects & Upgrades

All Experimenters Meeting

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May 23, 2011

Agenda

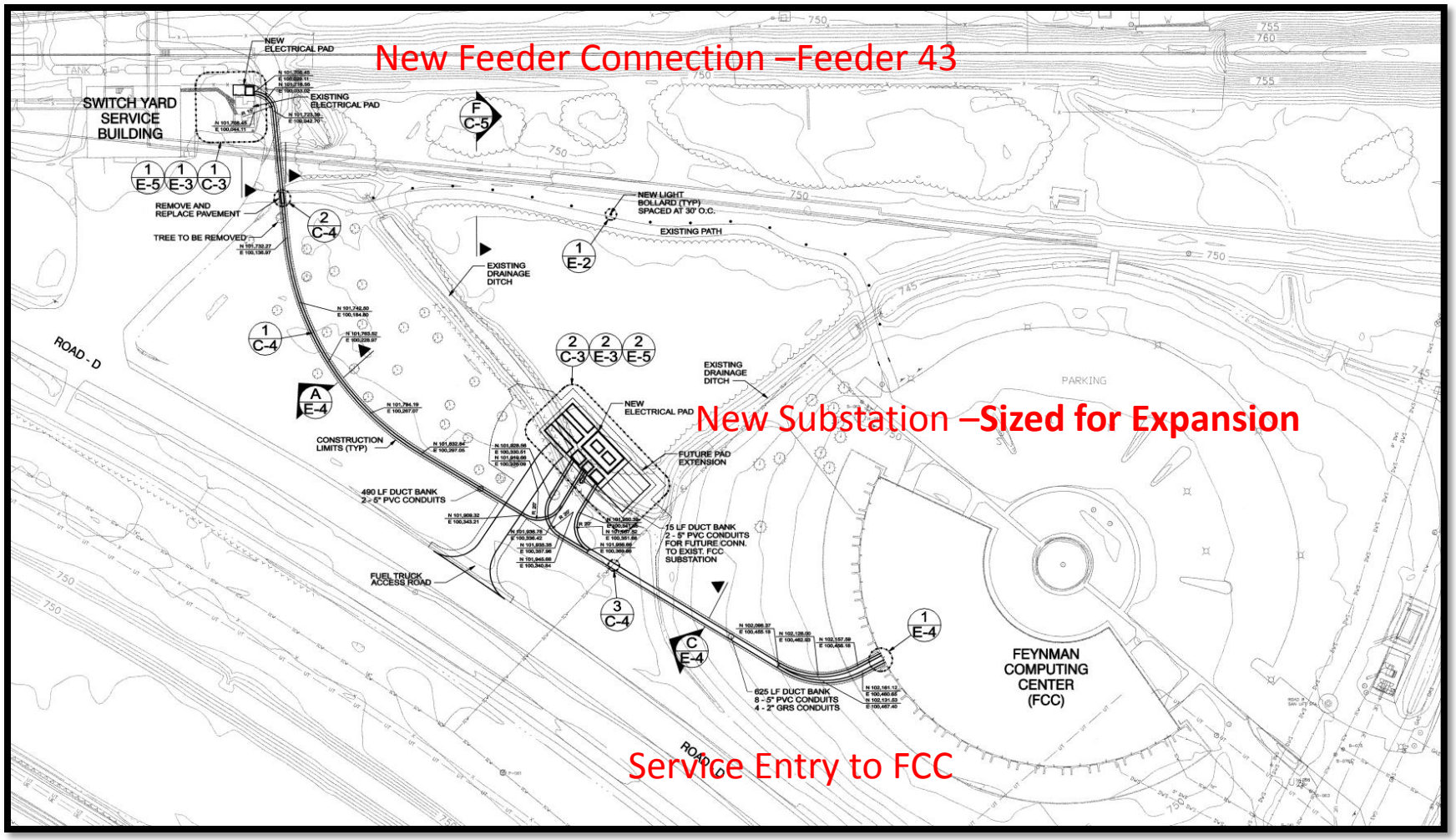
- Background
- High Availability Computing Center
- FCC Cooling Upgrades

Background

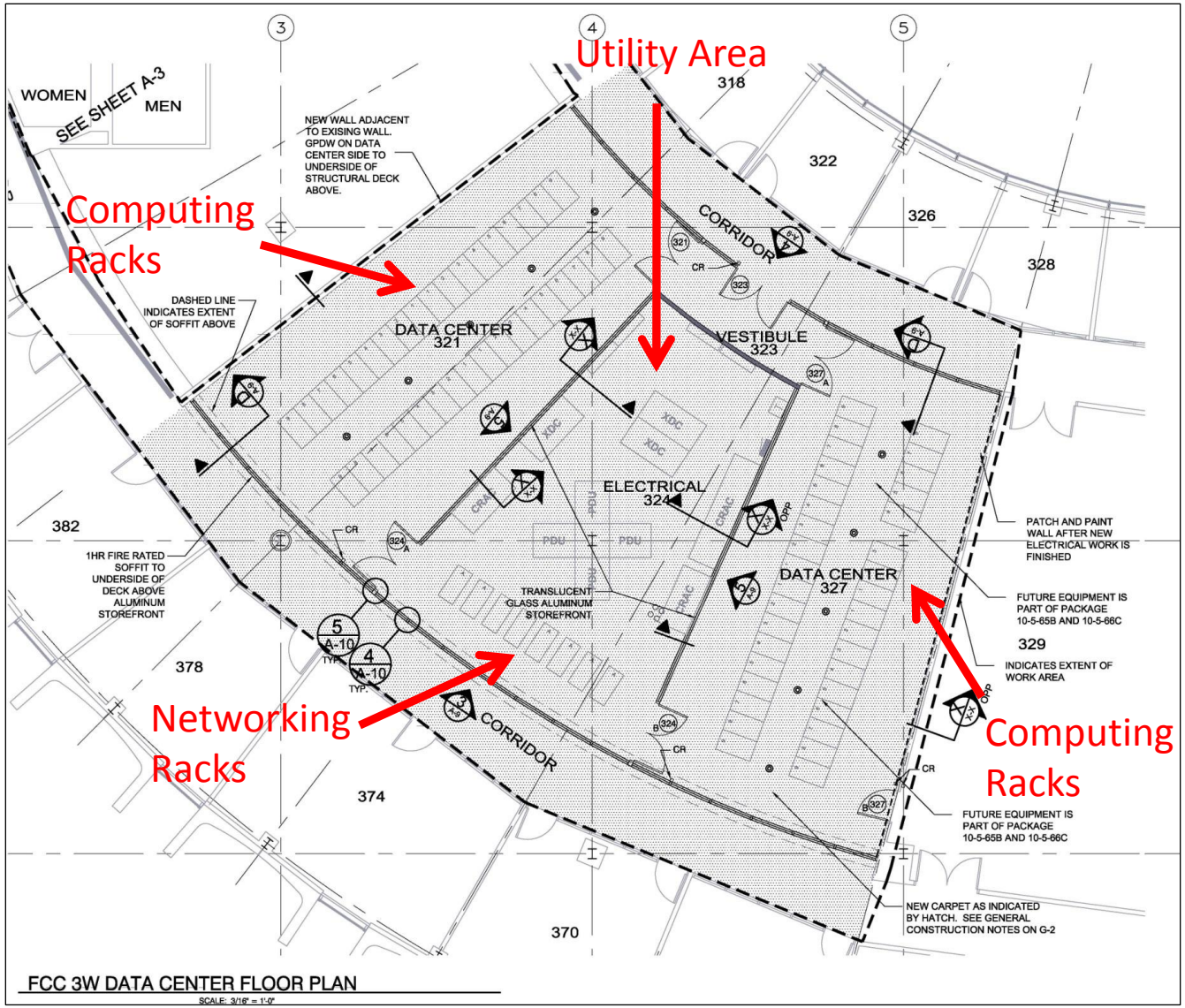
- Insufficient High Availability* computing space
  - Forecast - out of capacity in late 2009
    - Electrical power at building entrance & UPS
    - Electrical distribution to computing racks
    - FCC cooling systems nearing end of life and full capacity
- ARRA* projects ramp up in 2009
  - Design in 2009
  - Construction phases in early 2010

*High Availability = UPS & emergency generator
*American Recovery and Reinvestment Act (ARRA)

FCC Feeder Upgrade



FCC3W Computer Room

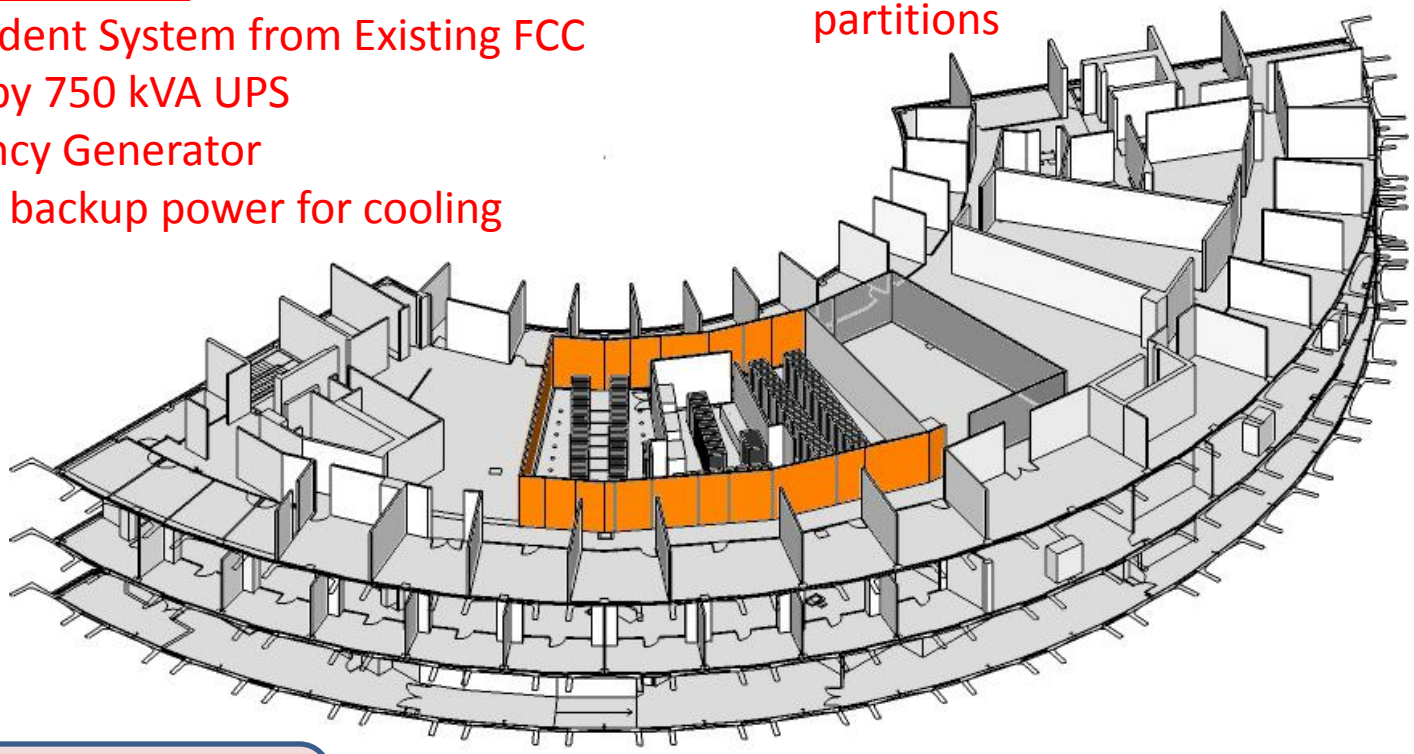


From Project Statement: "increase the electrical capacity and associated support functions for the Feynman Computing Center in order to support high availability computing operations"

HACC Data Center Outfitting

Electrical Upgrade
Independent System from Existing FCC
Backed by 750 kVA UPS
Emergency Generator
Includes backup power for cooling

Glass walls at corridors, drywall interior partitions

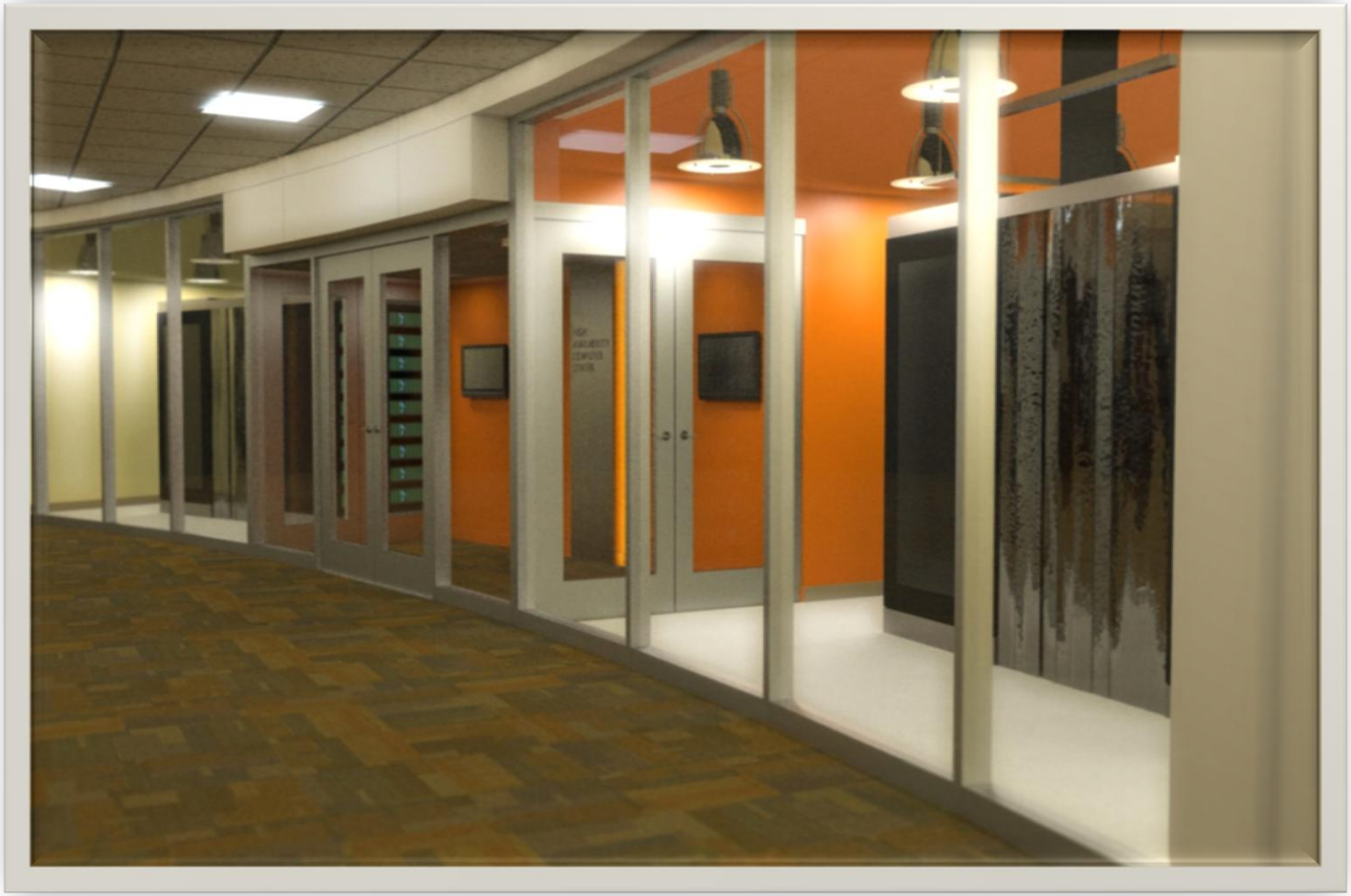


NTP Issued: Apr. 2010
Production: Jan. 2011

~72 47u racks, 6-7 kw/rack, 208V, accommodates dual cording

HACC Data Center Outfitting

FCC3 HACC North View



FESS Conceptual Rendering

FCC3 HACC South View

Photo from Mark Kaletka

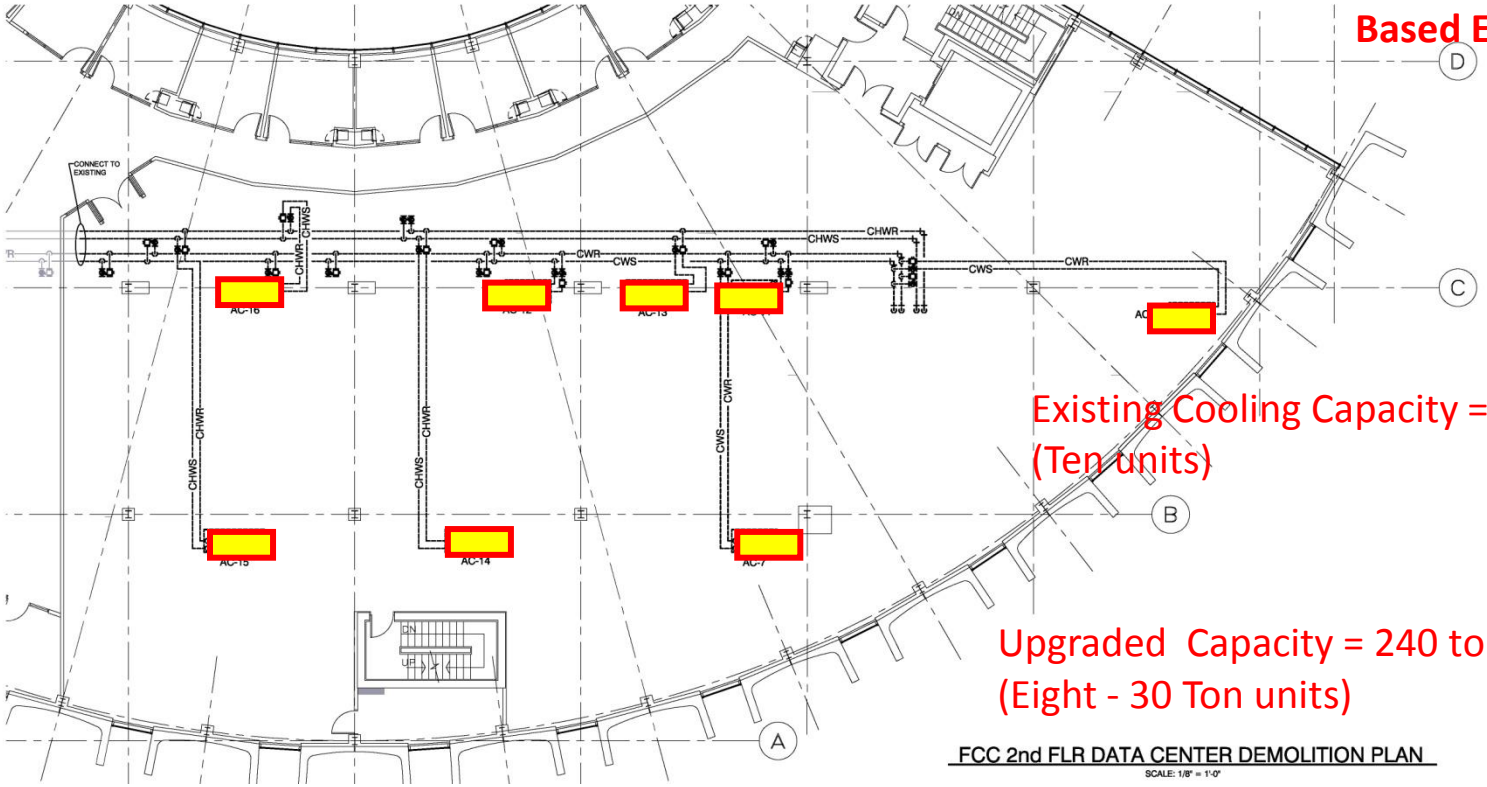
FCC2 Cooling Upgrade

From Project Statement: “provide modern computing room cooling equipment for the Feynman Computing Center in order to support program driven computing operations”

NTP Issued: Apr. 2010
Production: Aug. 2011

FCC2 Cooling Upgrade

Replace Existing +20 Year Old, Water Source Units with Modern Refrigerant Based Equipment

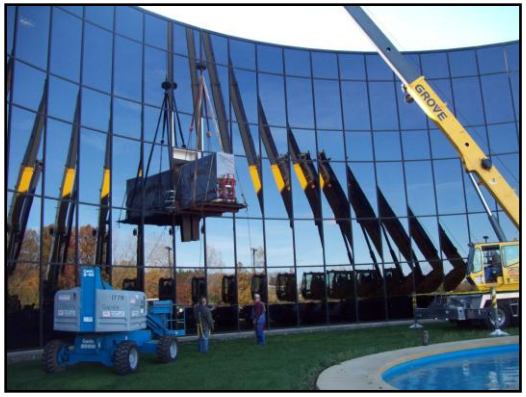


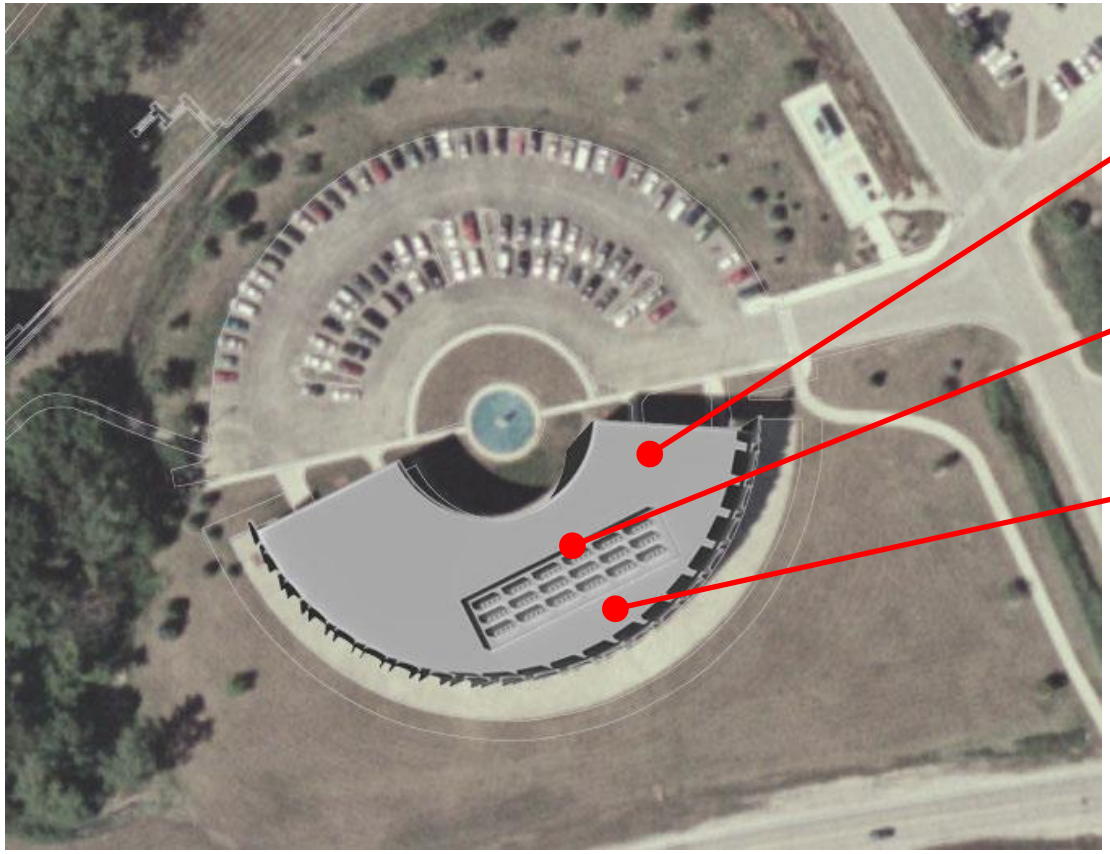
Existing Cooling Capacity = 156 tons
(Ten units)

Upgraded Capacity = 240 tons
(Eight - 30 Ton units)

FCC 2nd FLR DATA CENTER DEMOLITION PLAN
SCALE: 1/8" = 1'-0"

FCC Roof Mods

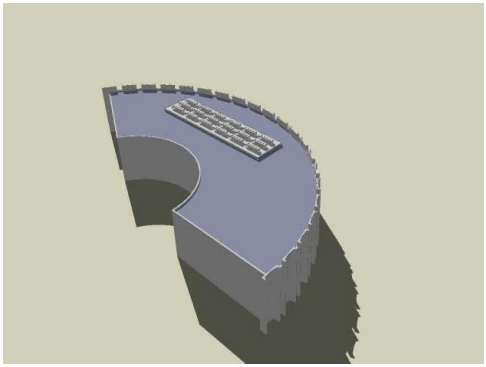




Reroofing of FCC

Structural Steel Mechanical Platform for condensers for FCC2 and FCC3

Stair Extension from South Stairwell to Roof



Key Upgrade Benefits

To the Science Program and the Laboratory

- FCC3 High Availability Computer Room
  - Additional electric & cooling ***capacity***
  - 72 racks; 750kVA UPS; *high efficiency*
- FCC2 Cooling Upgrades
  - *Removed SPOF* (single point of failure) ICW cooling
  - Replaced near end of life cooling systems
    - *New cooling systems* are higher efficiency
- More possibilities for *redundancy* planning of computing services
- Reduced FCC computer room footprint (sqft) while increasing power & cooling capacity

Thanks to FESS Engineering for excellent design work & construction oversight